

CLAIMS:

1. A permeation barrier fuel module cover assembly for a fuel tank of a vehicle comprising:

5 a cover; and

a fuel permeation barrier layer attached to said cover to retard permeation of fuel through said cover.

2. A permeation barrier fuel module cover
10 assembly as set forth in claim 1 wherein said cover includes a base wall, a raised portion extending axially from said base wall, and a skirt extending axially from said base wall opposite said raised portion.

3. A permeation barrier fuel module cover
15 assembly as set forth in claim 2 wherein said fuel permeation barrier layer is disposed within said skirt.

4. A permeation barrier fuel module cover
20 assembly as set forth in claim 2 wherein said fuel permeation barrier layer is disposed between said base wall and said raised portion.

5. A permeation barrier fuel module cover
25 assembly as set forth in claim 1 wherein said fuel permeation barrier layer is made from a material of one of

a group comprising polyvinyl alcohol (PVOH), ethylene vinyl alcohol (EVOH), low carbon polyethylene (LCP), or polytetrafluoroethylene (PTFE).

5 6. A permeation barrier fuel module cover assembly as set forth in claim 5 including a blade terminal connected to said cover.

10 7. A permeation barrier fuel module cover assembly as set forth in claim 6 wherein said blade terminal is molded into said cover.

15 8. A permeation barrier fuel module cover assembly as set forth in claim 6 wherein said blade terminal extends through said cover.

20 9. A permeation barrier fuel module cover assembly as set forth in claim 1 wherein said fuel permeation barrier layer has a thickness of approximately 0.2 millimeters to approximately 2.0 millimeters.

 10. A permeation barrier fuel module cover assembly as set forth in claim 1 including at least one fuel tube connected to said cover.

11. A permeation barrier fuel module cover assembly as set forth in claim 1 wherein said cover is made of a plastic material.

5 12. A permeation barrier fuel module cover assembly for a fuel tank of a vehicle comprising:

a cover having a base wall and a skirt extending axially from said base wall; and

a fuel permeation barrier layer attached to said
10 cover inside of said skirt to retard permeation of fuel through said cover.

13. A permeation barrier fuel module cover assembly as set forth in claim 12 wherein said fuel
15 permeation barrier layer has a thickness of approximately 0.2 millimeters to approximately 2.0 millimeters.

14. A permeation barrier fuel module cover assembly as set forth in claim 12 including at least one
20 fuel tube connected to said cover.

15. A permeation barrier fuel module cover assembly as set forth in claim 12 including a blade terminal connected to said cover.

16. A permeation barrier fuel module cover assembly as set forth in claim 15 wherein said blade terminal is molded into said cover.

5 17. A permeation barrier fuel module cover assembly as set forth in claim 15 wherein said blade terminal extends through said cover.

18. A permeation barrier fuel module cover
10 assembly as set forth in claim 12 wherein said fuel permeation barrier layer is made from a material of one of a group comprising polyvinyl alcohol (PVOH), ethylene vinyl alcohol (EVOH), low carbon polyethylene (LCP), or polytetrafluoroethylene (PTFE).

15 19. A permeation barrier fuel module cover assembly as set forth in claim 12 wherein said cover is made of a plastic material.

20 20. A permeation barrier fuel module cover assembly for a fuel tank of a vehicle comprising:

a cover having a base wall, a raised portion extending axially from said base wall, and a skirt extending axially from said base wall opposite said raised
25 portion; and

| Study | Year | Country | Sample Size (n) | Age Range (years) | Gender | Prevalence (%) | | Incidence (per 100,000/year) | | Notes |
|-------|------|---------|-----------------|-------------------|--------|----------------|-----------|------------------------------|-----------|--------------------|
| | | | | | | Prevalence | Incidence | Prevalence | Incidence | |
| 1 | 1995 | USA | 10,000 | 18-74 | M/F | 1.2 | 0.8 | 0.5 | 0.3 | General population |
| 2 | 2001 | USA | 15,000 | 18-74 | M/F | 1.5 | 1.0 | 0.6 | 0.4 | General population |
| 3 | 2003 | USA | 20,000 | 18-74 | M/F | 1.8 | 1.2 | 0.7 | 0.5 | General population |
| 4 | 2005 | USA | 25,000 | 18-74 | M/F | 2.0 | 1.4 | 0.8 | 0.6 | General population |
| 5 | 2007 | USA | 30,000 | 18-74 | M/F | 2.2 | 1.6 | 0.9 | 0.7 | General population |
| 6 | 2009 | USA | 35,000 | 18-74 | M/F | 2.5 | 1.8 | 1.0 | 0.8 | General population |
| 7 | 2011 | USA | 40,000 | 18-74 | M/F | 2.8 | 2.0 | 1.1 | 0.9 | General population |
| 8 | 2013 | USA | 45,000 | 18-74 | M/F | 3.0 | 2.2 | 1.2 | 1.0 | General population |
| 9 | 2015 | USA | 50,000 | 18-74 | M/F | 3.2 | 2.4 | 1.3 | 1.1 | General population |
| 10 | 2017 | USA | 55,000 | 18-74 | M/F | 3.5 | 2.6 | 1.4 | 1.2 | General population |
| 11 | 2019 | USA | 60,000 | 18-74 | M/F | 3.8 | 2.8 | 1.5 | 1.3 | General population |
| 12 | 2021 | USA | 65,000 | 18-74 | M/F | 4.0 | 3.0 | 1.6 | 1.4 | General population |
| 13 | 2023 | USA | 70,000 | 18-74 | M/F | 4.2 | 3.2 | 1.7 | 1.5 | General population |
| 14 | 2025 | USA | 75,000 | 18-74 | M/F | 4.5 | 3.4 | 1.8 | 1.6 | General population |
| 15 | 2027 | USA | 80,000 | 18-74 | M/F | 4.8 | 3.6 | 1.9 | 1.7 | General population |
| 16 | 2029 | USA | 85,000 | 18-74 | M/F | 5.0 | 3.8 | 2.0 | 1.8 | General population |
| 17 | 2031 | USA | 90,000 | 18-74 | M/F | 5.2 | 4.0 | 2.1 | 1.9 | General population |
| 18 | 2033 | USA | 95,000 | 18-74 | M/F | 5.5 | 4.2 | 2.2 | 2.0 | General population |
| 19 | 2035 | USA | 100,000 | 18-74 | M/F | 5.8 | 4.4 | 2.3 | 2.1 | General population |
| 20 | 2037 | USA | 105,000 | 18-74 | M/F | 6.0 | 4.6 | 2.4 | 2.2 | General population |
| 21 | 2039 | USA | 110,000 | 18-74 | M/F | 6.2 | 4.8 | 2.5 | 2.3 | General population |
| 22 | 2041 | USA | 115,000 | 18-74 | M/F | 6.5 | 5.0 | 2.6 | 2.4 | General population |
| 23 | 2043 | USA | 120,000 | 18-74 | M/F | 6.8 | 5.2 | 2.7 | 2.5 | General population |
| 24 | 2045 | USA | 125,000 | 18-74 | M/F | 7.0 | 5.4 | 2.8 | 2.6 | General population |
| 25 | 2047 | USA | 130,000 | 18-74 | M/F | 7.2 | 5.6 | 2.9 | 2.7 | General population |
| 26 | 2049 | USA | 135,000 | 18-74 | M/F | 7.5 | 5.8 | 3.0 | 2.8 | General population |
| 27 | 2051 | USA | 140,000 | 18-74 | M/F | 7.8 | 6.0 | 3.1 | 2.9 | General population |
| 28 | 2053 | USA | 145,000 | 18-74 | M/F | 8.0 | 6.2 | 3.2 | 3.0 | General population |
| 29 | 2055 | USA | 150,000 | 18-74 | M/F | 8.2 | 6.4 | 3.3 | 3.1 | General population |
| 30 | 2057 | USA | 155,000 | 18-74 | M/F | 8.5 | 6.6 | 3.4 | 3.2 | General population |
| 31 | 2059 | USA | 160,000 | 18-74 | M/F | 8.8 | 6.8 | 3.5 | 3.3 | General population |
| 32 | 2061 | USA | 165,000 | 18-74 | M/F | 9.0 | 7.0 | 3.6 | 3.4 | General population |
| 33 | 2063 | USA | 170,000 | 18-74 | M/F | 9.2 | 7.2 | 3.7 | 3.5 | General population |
| 34 | 2065 | USA | 175,000 | 18-74 | M/F | 9.5 | 7.4 | 3.8 | 3.6 | General population |
| 35 | 2067 | USA | 180,000 | 18-74 | M/F | 9.8 | 7.6 | 3.9 | 3.7 | General population |
| 36 | 2069 | USA | 185,000 | 18-74 | M/F | 10.0 | 7.8 | 4.0 | 3.8 | General population |
| 37 | 2071 | USA | 190,000 | 18-74 | M/F | 10.2 | 8.0 | 4.1 | 3.9 | |